A NOTE ON TWO SPECIES OF ASTRALIUM FROM PORT JACKSON.

By H. Leighton Kesteven.

Under the name of *Astralium tentoriforme*, Jonas, two species of that genus have, in Sydney, been united. These two present the anomaly of two species, undeniably distinct, so like one another that in some instances only the operculum will show to which species a specimen belongs. In the neanic stage, however, the two species are easily separable.

Astralium (Uvanilla) fimbriatum, Lamarck.

Trochus fimbriatus, Lamarck, Anim. sans Vert. ed. i., vii., p. 12, 1822; Delessert, Recueil, etc., pl. 34, figs. 6*a* and *b*, 1841; Quoy & Gaimard, Voy. Astr. iii., p. 229, pl 61, fig. 8, operculum figs. 11, 12, 1835; Chenu, Man. Conch. i., fig. 2573; Philippi, Conch. Cab. ii., p. 121, pl. 20, fig. 7, 1846.

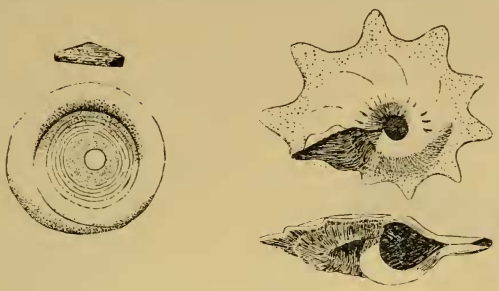
Carinidea fimbriata, Swainson, Proc. Roy. Soc. Van Diemen's Land, 1854, Vol. iii., p. 39, pl. vi., figs. 3, 4.

Calcar fimbriatum, Kiener & Fischer, Coq. Viv. Turbinacées, iii., p. 38, pl. 32, fig. 2, 1880.

Astralium fimbriatum, Tryon, Man. Conch. x., p. 239, pl. 54, figs. 47, 48, 49; operculum, pl. 60, f. 46, 1888.

Trochus squamiferus, Koch in Philippi, Abild. i., pl. 4, fig. 9, p. 138, 1844.

Reeve's figure of the species* is of his *A. pileolum.*



A. fimbriatum.

Fig. 1.—Neanic stage and operculum thereof, and adult operculum.

Tryon regards *A. squamiferum* as a variety of *A. fimbriatum*, whilst Fischer (*loc. cit.*) and Tate and May† consider the name an absolute synonym, a decision which is doubtless correct.

Other varieties, according to Tryon, are *A. pileolum*, Reeve (1842), and *A. cucullatum*, Kiener ‡ The former is decidedly a distinct species: the latter will most likely be found to be distinct also, unless perhaps it is a variety of *A. tentoriforme.*

This species is not so common in Port Jackson as the succeeding.

Astralium (Uvanilla) tentoriforme, Jonas.

Trochus tentoriformis, Jonas, Zeitsch. f. Malak., 1845, p. 66; Philippi, Conch. Cab. ii., p. 116, pl. 20, fig. 1, 1846; Reeve, Conch. Icon. xiii. pl. viii., fig. 43, 1861.

Trochus urvillei, Philippi, Conch. Cab. ii. p. 215, pl. 32, fig. 4, 1846; Reeve, Conch. Icon. xiii., pl. ix., fig. 46, 1861.

Trochus georgianus, Quoy, MS., *fide* Kiener, Sp. Genr. Trochus, pl. 31, fig. 2, 1880.

Calcar tentoriforme, Kiener & Fischer, Coq. Viv. Turbinacées iii., p. 41, pl. 79, fig. 2, 1880.

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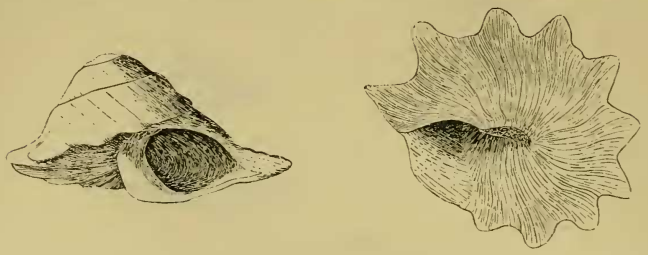
* Conch. Icon. xiii. pl. ix. fig. 49.

† Proc. Linn. Soc. N.S.W. xxvi. (2), 1901, p. 400.

‡ Coq. Viv. Turbinacées, iii. p. 40, pl. 32, fig. 3, 1880.

Astralium tentoriforme, Tryon, Man. Conch. x., p. 240, pl. 53, figs. 41, 42, 1888.

Trochus fimbriatus, Quoy & Gaimard, *op. cit.*, pl. 61, fig. 9, 1835.



A. tentoriforme.

Fig. 2.—Neanic stage.

Quoy & Gaimard (*loc. cit.*) speak of a variety "plus épaisse et plus pyramidale" which was evidently the original of their fig. 9. Philippi quotes this figure as being of his *T. urvillei*. Fischer regards Philippi's species as the young of a variety β, *T. georgianus*, being presumably the adult; the figure of this is the best representation of *A. tentoriforme* as it is known in Port Jackson. The species is very common in all the fresher reaches of Sydney Harbour and the coasts of New South Wales.

In literature these two species are more distinct than in life. Both species are very variable. Specimens of *A. tentoriforme* occur nearly as flat as *A. fimbriatum*, var. *squamiferum*, and almost as fimbriated as var. *cucullatum* (see Tryon's figs. 52, 50) whilst pyramidal unornamented specimens of *A. fimbriatum* are not uncommon. My figures show the differences between these species in their neanic stage. The best characters for identification of the adult shells are offered by the base, and may be tabulated as follows:—

A. fimbriatum.	*A. tentoriforme*
(1) Base convex.	(1) Base concave.
(2) Columella ending in a small tooth	(2) Columella ending in a prominent tooth.
(3) Lower lip joining the upper lip at the extreme edge.	(3) Lower lip set inside the upper lip

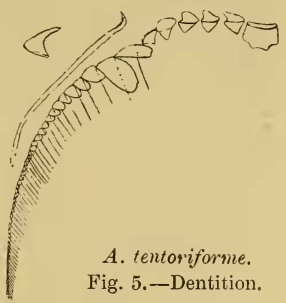
As a rule *A. fimbriatum* is flatter than *A. tentoriforme.* Although the above characters are the most constant, none of them can be implicitly relied on. I have seen *A. fimbriatum* with a concave base and *A. tentoriforme* without any sign of a tooth. There is, however, one recognition mark to which one may pin one's faith—the operculum; this will be always found reliable. The differences are shown by my figures.

A. fimbriatum
Fig. 3.—Adult operculum.

A. tentoriforme.
Fig. 4.—Adult operculum.

The radulæ are almost exactly alike; if there is any difference it is that the marginals of *A. fimbriatum* are larger than those of *A. tentoriforme.*

It is more than probable that both species occur in South Australia and Tasmania, though only *A. fimbriatum* has been recorded from there. *T. georgianus* was obtained at King George's Sound, S.W. Australia.



A. tentoriforme.
Fig. 5.—Dentition.

These two species would seem to present an exception to the rule that distinctive characters are inherited earlier in successive generations, for by that theory *A. fimbriatum* should be descended from discoidal ancestors, whilst *A. tentoriforme* should come from trochiform ancestors, and such a divergence of ancestry would be manifested in anatomical characters.

Postscript.—Two outline drawings of the apices of *Columbella semiconvexa*, Lamarck, and *C. australis*, Gaskoin (figs. 6-7), shown

me by Mr. C. Hedley, illustrate the fact that they present another example of, if I may be allowed the term, convergence of

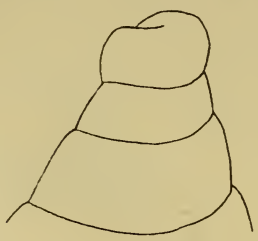


Fig. 6.—*C. australis.*

Fig. 7—*C. semiconvexa.*

development. Like the two species discussed above, they are, when adult, so alike that, devoid of their epidermis, they are practically inseparable, whilst their apices are quite different. They are, however, easier to identify than the two species of *Astralium*, *C. australis*, having a sutural frill of epidermis, which is absent in *C. semiconvexa*.

To Miss M. Lodder I am indebted for the opportunity to study the growth of *Astralium aureum*, Jonas.* In the neanic stages it is very similar to *A. fimbriatum*, Lamarck (*April 30th, 1902*).

* Philippi's Abbild., 1844, Vol. ii., p. 14, t. 6, fig. 2.